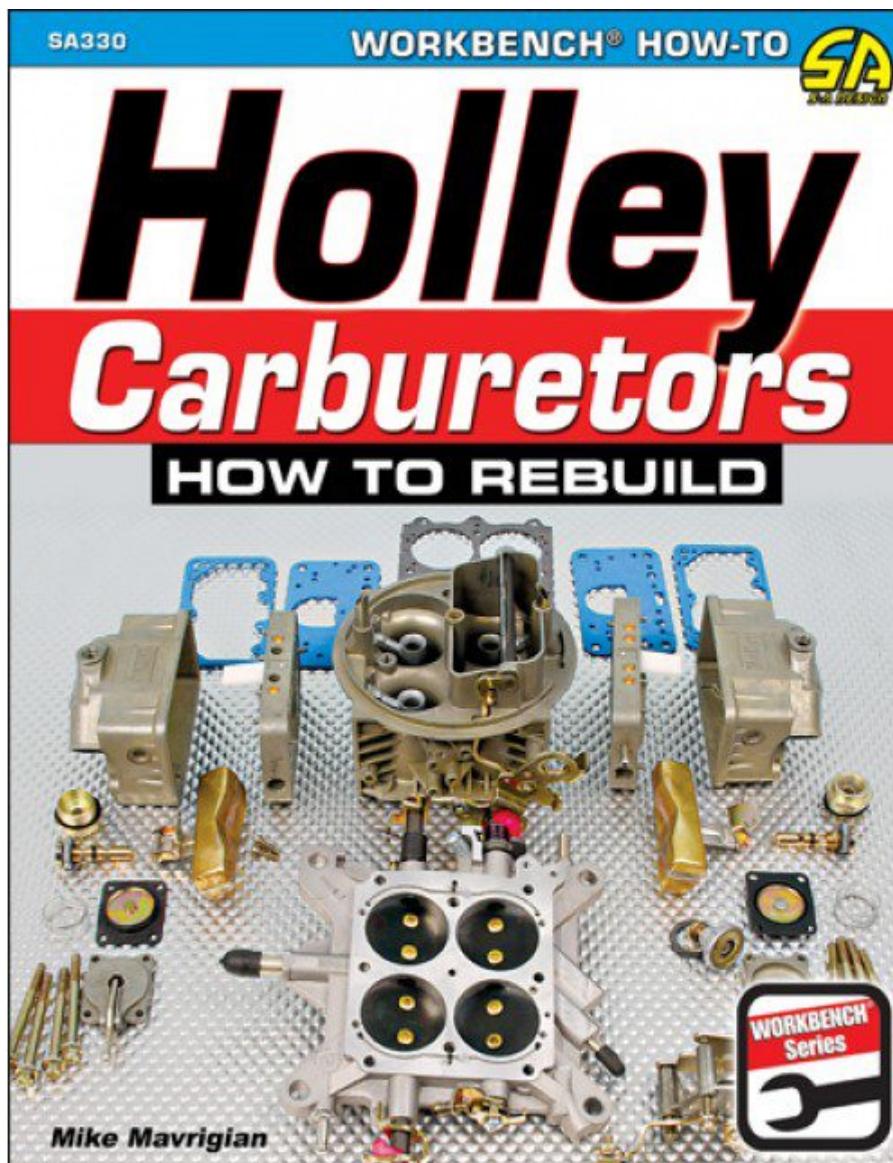


JULY 16, 2017

Muscle Car Diy

## Holley Carburetor Disassembly Guide: Rebuild Step-by-Step • Muscle Car DIY

If you plan to disassemble a carburetor, it should be done with the carburetor removed from the intake manifold and placed on a clean workbench. To make the carb more stable, place it on a stand that supports the carb by its baseplate-to-manifold mounting holes. This also makes the disassembly job much easier.



This Tech Tip is From the Full Book, [HOLLEY CARBURETORS: HOW TO REBUILD](#). For a comprehensive guide on this entire subject you can visit this link:

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Various stand designs are available, including individual plastic stanchions that snap into the baseplate holes, cast-aluminum one-piece stands with four dowels that engage the baseplate holes, or vise-mounted stands that engage the baseplate mounting holes and allow the carb to pivot during service for easy access. Allow the carb to cool completely before removing it from the intake manifold. Before removing the fuel inlet hose or line, place a small drain cup under the fitting(s) to catch any fuel that spills during removal of the fuel feed.



AED's adjustable carb fixture adapts to any carb and allows securing to a bench vise. The carb can be rotated for easy access to the entire carb.

When the carb is removed from the engine, but before servicing, drain as much fuel as possible by rotating the carb slowly (sideways and upside down) over a fuel-safe drain pan. Some fuel will likely remain, but this eliminates most of the fuel present in the bowls and circuits.

## Fuel Inlet Removal

On a 4150 or 4500 carburetor, the primary and secondary fuel bowl inlet fittings thread directly into the bowls; they use a male hex drive. Depending on the specific carburetor, either a 1- or 3/4-inch wrench is required. Models requiring a 1-inch wrench have little access between the hex and bowl. It's common to use a 1-inch open-end wrench, engaging and unscrewing in small increments because of the tight space. Carbs with the smaller 3/4-inch hex have more clearance for an open-end, box, or socket wrench.



This 4150 Double Pumper carburetor is fully disassembled, except for the shafts and throttle plates from the baseplate. If you do not perform carburetor service on a regular basis, you can see why it's important to keep everything organized during disassembly. It's not a bad idea to take a few digital photos during your disassembly, and to bag and tag parts (primarily the float assembly, etc.) to avoid confusion during cleaning and reassembly.



Prior to disassembly, mount the carburetor on a working stand. This provides a stable platform on the workbench and provides clearance for the linkage.



Several types of carburetor stands are available. Inexpensive plastic stanchions such as this one simply snap into the baseplate mounting holes.

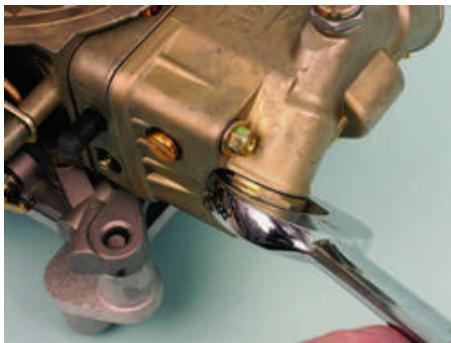
The fuel inlet fittings have right-hand threads; rotate the fittings counterclockwise during removal. Depending on the specific carburetor, an internal in-line screen or sintered bronze fuel filter may be present. Be careful when removing the fittings so that you do not drop or lose a filter.

On 4160 carbs with a single fuel feed at the primary fuel bowl, a banjo-type fitting may be present on the driver's side of the fuel bowl. Using an 11/16-inch wrench, rotate the banjo bolt counterclockwise to loosen and then remove it.

Each side of the banjo fitting includes a thin sealing washer. Be careful not to drop or lose these two sealing washers. The hex flats on the banjo bolt are very shallow. Use care when engaging the wrench; make sure that the flats are fully engaged to avoid damaging the hex head.

## Fuel Inlet Removal

### Step 1: Remove Fuel Inlet Fittings

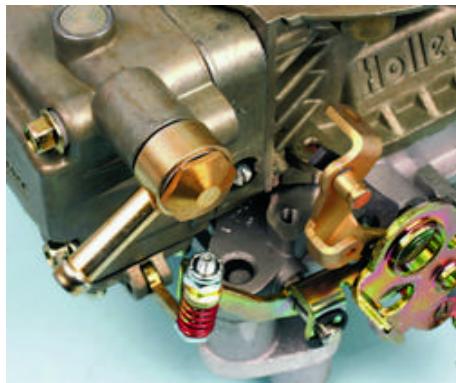


Remove the fuel inlet fittings before removing the fuel bowls. This allows you to hold the carb steady while cracking the fittings loose. Some 4150- and 4500-series fuel inlet fittings have a 1-inch hex. Clearance between the hex and the fuel bowl is tight, so you need an open-end wrench, not a common 1-inch socket or box wrench.

When removing the fuel inlet fitting, note that a thin metal crush washer is in place. This washer may stay with the fitting when removed, or it may stick to the fuel bowl inlet fitting port. If you don't see the washer on the fitting, be sure to retrieve it from the fuel bowl.

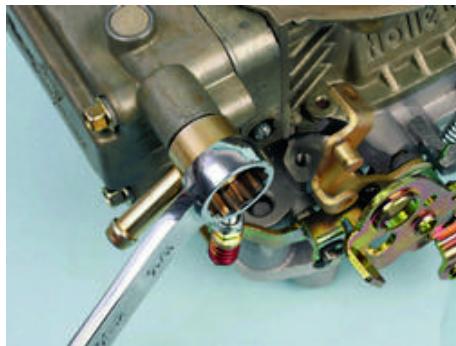


#### Step 2: Remove Fuel Inlet Fittings (CONTINUED)



A 4160 car with a single fuel inlet on the primary bowl has a banjo-style fitting assembly. Remove the banjo bolt to free the assembly from the fuel bowl.

The banjo bolt requires an 11/16-inch wrench. A socket, box, or open-end wrench suffices.



#### Step 3: Fully Engage Wrench



The banjo bolt's hex head surfaces are fairly thin. Make sure that the wrench is fully engaged to avoid burring the brass head.

#### Step 4: Separate Fuel Fitting from Body



After you unthread the banjo bolt from the fuel bowl, remove the assembly, which includes the banjo bolt, banjo fitting, and filter. A thin crush washer is present on each side of the banjo fitting, one between the banjo bolt head and fitting and one between the banjo fitting and the fuel bowl.

#### Step 5: Remove Fuel Inlet Fitting



Some 4150 carbs have fuel inlet fittings with a smaller 3/4-inch hex drive, requiring a 3/4-inch wrench. This smaller hex provides easier access than the 1-inch hex fitting used on other carbs. The smaller hex protrudes a bit farther for easier wrench engagement.

## Fuel Bowl Removal

With the carb mounted on a support stand, place a shop towel under the primary fuel bowl to catch any residual fuel. Remove each of the four fuel-bowl screws, along with each screw's sealing washer using a 5/16-inch socket with a 1/4-inch-drive ratchet. This combination provides maximum clearance between the socket wrench and the fuel bowl. The washers may remain on the screws or they may stay stuck to the fuel bowl. If a washer sticks to the fuel bowl, use a small flat-blade screwdriver to gently pop the washer free, and then place the washer(s) onto their respective fuel-bowl screws. This helps to keep everything in order and prevent losing any washers.



## Carb Orientation

During carb disassembly, try to keep the carb oriented in one direction. For example, keep the primary side on your left and the secondary side on your right. If you're new to carburetor work, this helps you to keep parts organized and identifiable regarding their location on the carb. ■

If you perform a disassembly for cleaning or rebuilding purposes, plan to use new gaskets (fuel bowl to metering block and block to main body). Even so, it's best to try to avoid damaging the original gaskets. You may be forced to reuse one in a pinch, and they are great for identifying and matching to the new gaskets.

Gently pry each gasket loose. Usually, with enough patience and care, you can remove them without tearing. Set the gaskets aside, organizing them next to the fuel bowl and metering block.

### Step 1: Remove Float Bowl Screws



Years ago, some Holley fuel-bowl screws had a slotted head that required using a flat-blade screwdriver. The common screws used today have a hex head, which require a 5/16-inch wrench. Crack each screw loose, and then continue to remove all four. Each fuel-bowl screw seals to the fuel bowl with a sealing washer. If the washer does not stay with the screw, it's likely stuck onto the fuel bowl. Make sure to retrieve all washers and keep them with the screws.

### Step 2: Separate Fuel Bowl from Main Body (Professional Mechanic Tip)



The gasket may cause the fuel bowl to stick. Do not jam a flat-blade screwdriver or chisel between the fuel bowl and metering block, or between the metering block and main body. This can result in gouges at the mating edges, which potentially create raised burrs that prevent proper sealing during reassembly. A light tap with a plastic

hammer pops it loose. Avoid digging between the fuel bowl and metering block with a screwdriver or chisel, as this can gouge the mating edges.

#### Step 3: Remove Fuel Bowl Gasket



If you want to save the original gasket, carefully peel it off the metering block. Several small dowel pins locate the gasket. Peeling the gasket off in a hurry can easily result in tearing the gasket at the dowel locations.

#### Step 4: Inspect Metering Block (Critical Inspection)



When you have a metering block (primary side on all carbs, and on the rear of 4150 and 4500 carbs), no additional screws are present. With the fuel bowl removed, only the gasket between the metering block and main body hold the metering block in place. Set the primary fuel bowl aside.

#### Step 5: Remove Metering Block



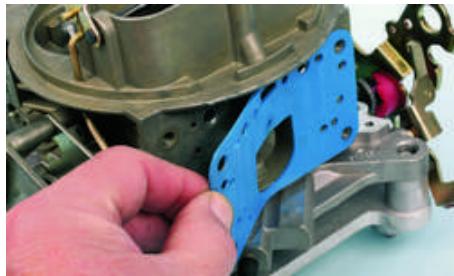
A few taps with a plastic hammer should easily dislodge the metering block from the main body. Quite often, simply wiggling and pulling with your fingers is enough to remove the block.

#### Step 6: Remove Metering Block Gasket



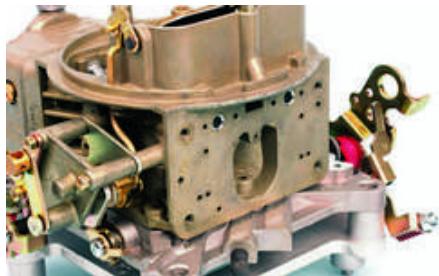
Use care when removing the gasket that sealed the metering block to the body. You should be able to remove the gasket intact if you're careful.

#### Step 7: Inspect Main Body Casting



The primary fuel bowl, gaskets, and metering block have been removed, so at this stage, inspect the main body casting for any damage or unusual wear.

#### Step 8: Remove Fuel Bowl Sight Plugs (Professional Mechanic Tip)



Remove the brass fuel bowl sight plugs by rotating each plug counterclockwise. Make sure that the screwdriver is seated fully and squarely to avoid burring the screw's drive slot. A thin crush washer seals the plug. Save the washer in case you decide to reuse it. Keep the sight-bowl screw and its washer bagged together to avoid losing. If the bowl has a glass sight window (as found on Ultra and HP models for example), a C-clip secures the glass. Squeeze the clip using C-clip pliers and remove the glass and the seal.

#### Metering Bowl Disassembly

If your carburetor is a 4150 or 4500, removal of the fuel bowl and metering block is identical to the steps you used during the primary-side service.

If your carb is a 4160, you may have an external fuel transfer tube on the driver's side. With the primary fuel bowl removed, you can simply pull the tube out of the secondary fuel bowl. The sealing gaskets at each end of the tube remain in the fuel bowls. Using a small flat-blade screwdriver, gently pry these rubber seals out of the front and rear bowls and set aside.

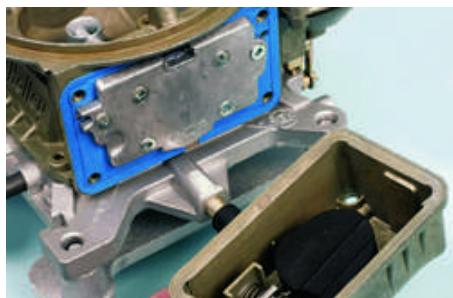
The 4160 carb primary fuel bowl is secured to the main body with four 12-24 x 2 1/2-inch screws, just as with the primary and secondary bowl screws found on 4150 and 4500 carbs.

However, because the secondary side of a 4160 carb has a thin metering plate instead of a metering block, the four 12-24 secondary bowl screws are shorter (17/8 inches) than those for the primary fuel bowl. Simply be aware of this. The longer 2 1/2-inch bowl screws that are required for bowls with metering blocks cannot be used at the secondary side of a 4160 carb with a metering plate.

The 4160 carburetors have a metering plate at the secondary side, which is secured independently to the main body with six flat-top clutch-head machine screws, size 8-32 x 1/2 inch. Although a small flat-blade screwdriver can be used to service these screws, the proper choice is a 5/32-inch clutch-head driver, which provides a positive engagement with the screw and prevents possible slipping and gouging.

The metering plate is likely to be slightly stuck to its gasket. Gently pry on the plate to remove it. Do not try to jam a flat-blade screwdriver between the plate and main body because it may cause scratches, gouges, or burrs that can prevent proper sealing during reassembly. Again, try to keep all parts organized and in order relative to the primary and secondary sides.

#### Step 1: Inspect Metering Plate



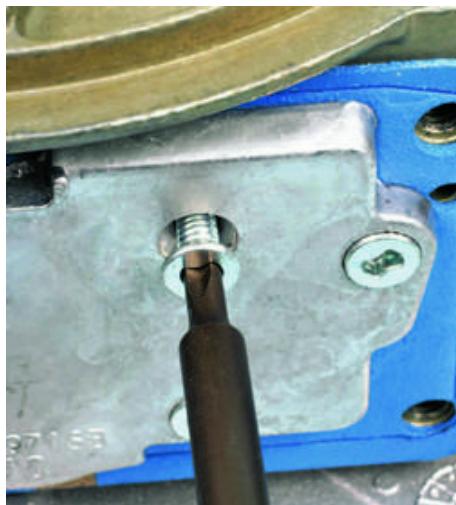
A 4160 carb has a metering plate on the secondary side, instead of a jet-equipped metering block.

#### Step 2: Remove Metering Plate Screws



The metering plate is secured to the main body with six clutch-head screws.

Although a small screwdriver may be used to remove clutch-head screws, the correct tool is a 5/32-inch clutch-head driver. This positively engages the hourglass-shape screw drive, avoiding the potential for damaging the screw.



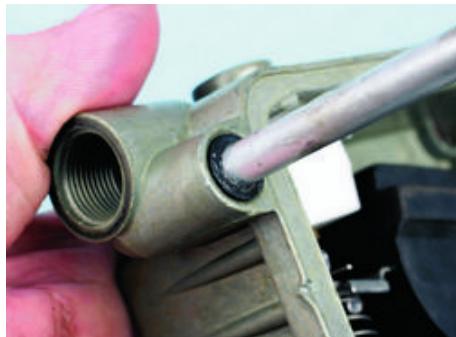
### Step 3: Inspect Fuel Transfer Tube (Critical Inspection)



This 4160 has a single fuel feed at the primary bowl and an external fuel transfer tube that routes fuel to the secondary bowl from the primary bowl. Each end of this tube seats into a

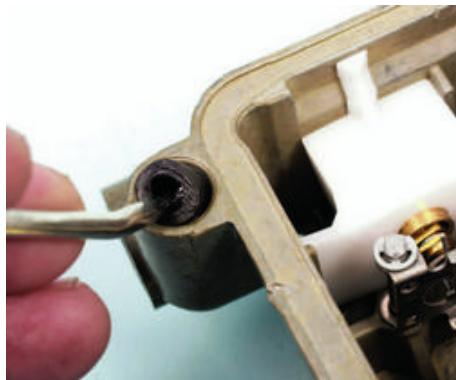
rubber grommet seal. When removing one of the fuel bowls, the tube sticks to one bowl and leaves the opposite bowl.

#### Step 4: Remove Fuel Transfer Tube



Gently twist and pull each tube free from its bowl. The tube exits easily.

#### Step 5: Remove Sealing Grommet from Fuel Bowl



Use a pick or small screwdriver to pull the sealing grommet from each fuel bowl. You can keep the seals as a reference, but you should always install new seals during assembly.

### Float Removal

The 4150 and 4500 carbs have center-hung floats; the 4160 carbs have side-hung floats. To remove a center-hung float, remove the two 6-32 x 1/2-inch screws that secure the float hinge to the bowl. This requires a small flat-blade screwdriver. A side-hung float pivots on a horizontal pin. A light spring on the underside of the float arm provides a support assist. To

remove the float, carefully remove the small C-clip that secures the float arm to the horizontal pin. Use a very small flat-blade screwdriver or a pick to pull the C-clip out of its groove on the stationary pin (a magnetic-tip screwdriver is a good idea to prevent dropping the clip). It's a good idea to store the float, spring, and C-clip in a Ziploc bag.

The needle and seat assembly is housed in a white nylon block, with a small wire clip that engages into the float's upper arm. Once the float is removed, the needle and seat easily fall out of the bore.

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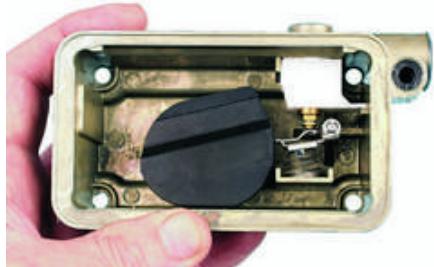
#### Step 1: Remove Fuel Bowl Float



A center-hung fuel bowl, as on 4150- and 4500-series carbs, secures to the inside upper center of the fuel bowl with two screws. Use a small flat-blade screwdriver to remove the two 6-32 x 1/2-inch float hinge screws. After unthreading the screws, if you have difficulty retrieving them while reaching in with your fingers, use needle-nose pliers, a pencil magnet, or a hemostat. A lightly spring-loaded hinge is attached to the float. Remove the float and hinge assembly as a unit. Keep the float and mounting screws together in a Ziploc bag to avoid losing the screws.



#### Step 2: Inspect Float



A side-hung float, as found on 4160 carbs, pivots on a pin located to one side, near the needle and seat. This is a secondary bowl from a 4160 carb.

#### Step 3: Remove C-Clip on Float Armature



The pivot pin for the float hinge has a small C-clip. This clip must be removed to remove the side-hung float.

#### Step 4: Remove C-Clip on Float Armature (CONTINUED)



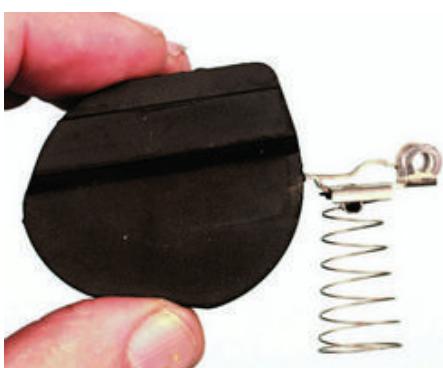
Use a small flat-blade screwdriver or a pick to dislodge the small C-clip. Be careful not to exert too much force, to avoid popping the clip off abruptly. It's small and easy to lose.

#### Step 5: Remove C-Clip on Float Armature (CONTINUED)



Use a small pencil magnet or magnetic-tipped screwdriver to retrieve the clip without dropping it. It's a good idea to place the float and C-clip into a small plastic bag to avoid losing the clip.

#### Step 6: Remove Side-Hung Float from Fuel Bowl



On a side-hung float, the light-assist spring is attached to the float hinge arm.

## Needle and Seat Removal (4150)

On a 4150 or 4500 carb, the needle and seat assembly in the primary and secondary fuel bowls are located at the top center of each fuel bowl.

### Step 1: Remove Float Bowl Needle and Seat



On center-hung float bowls, access the needle and seat assembly at the top exterior of the bowl. The screw serves as a lock to hold the adjusted position of the needle and seat. The hex provides needle and seat height adjustment. While holding the hex nut stationary with a 5/8-inch wrench, rotate the screw counterclockwise with a flat-blade screwdriver to loosen the hex.

### Step 2: Remove Float Bowl Screw and Hex Nut



Remove the locking screw and hex nut.

Remove the needle and seat assembly by rotating it counterclockwise. (The needle and seat upper section threads into the fuel bowl.)

### Step 3: Remove Needle and Seat from Port



Turn the needle and seat assembly counterclockwise until the threads have cleared the threaded section of the casting. Once it's unthreaded from the fuel bowl, pull the needle and seat assembly out of its port.

### Step 4: Inspect Adjuster Hex Nut



The adjuster hex nut has two opposing flats in the threaded hole. This engages onto the flats of the needle and seat assembly, allowing you to adjust the needle and seat up or down.



Instead of using a flat-blade screwdriver and a 5/8-inch wrench, this specialty needle and seat tool from Willy's Carburetors makes the job easier and quicker. The tool's female hex opening engages the needle and seat hex nut, while a straight blade on the tool's inner shaft engages the locking screw. Hold the tool's knurled aluminum body stationary and turn the black knob at the top of the tool to unthread the locking screw. Then turn the knurled body of the tool to raise and remove the needle and seat assembly



The slot-driver shaft and outer tool body are independent, allowing you to perform both tasks of screw loosening and nut removal with one tool. After you unthread the needle and seat, remove the entire assembly, including locking screw, adjuster nut, and needle and seat.

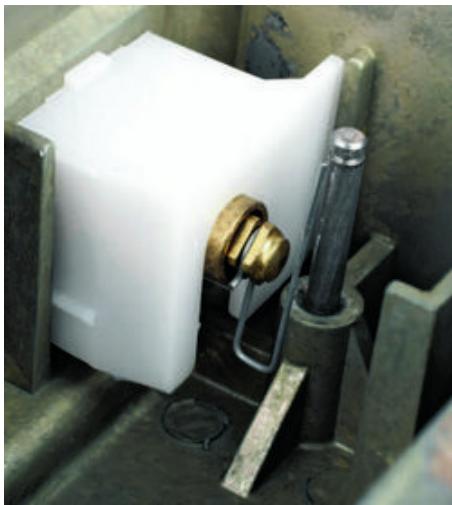
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### **Needle and Seat Removal (4160)**

On a 4160 carb, the needle and seat must be serviced with the fuel bowl removed. With the side-hung float removed, the needle and seat assembly is easily removed from its vertical overhead housing.

#### **Step 1: Remove Needle and Seat Assembly**



After the float has been removed, access the needle and seat assembly on a side-hung float bowl from inside the bowl. Inside a fuel-safe plastic housing, the needle and seat assembly has a wire clip that engages the float's hinge arm.

#### Step 2: Remove Needle and Seat Assembly (CONTINUED)



Simply turn the fuel bowl upright so the needle assembly can fall out of its housing bore.

#### Accelerator Pump Removal

The accelerator pump on the primary fuel bowl (and on the secondary fuel bowl of a Double Pumper carb) is secured with four 8-32 screws. The screws' length on 4150 and 4160 carbs is 3/8 inch; 4500 carbs tend to use a thicker housing, requiring a screw length of 9/16 inch.

A plastic cam is located at the throttle shaft where the accelerator pump operating lever makes contact. The shape of the cam dictates how quickly and how long the accelerator pump operates. It is held in place by a single screw that is removed with a flat-blade screwdriver.

### Step 1: Remove Accelerator Pump



Use a Phillips-style drive to remove the four screws securing the accelerator pump to the bottom of the fuel bowl. Now you can see the pump diaphragm.

### Step 2: Remove Accelerator Pump Diaphragm (Professional Mechanic Tip)



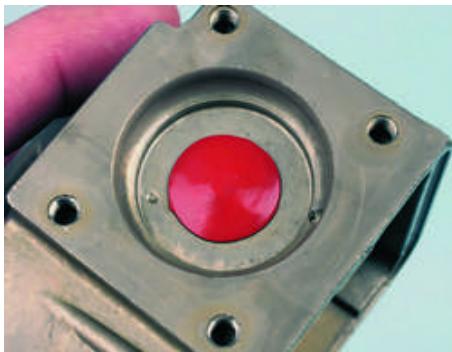
If you plan to reuse the original diaphragm, carefully peel the rubber from the fuel bowl.

### Step 3: Lift Diaphragm Spring from Casting



With the pump diaphragm removed, you see a light-assist spring. Simply remove the spring with your fingers.

#### Step 4: Remove Check Valve from Casting



The orange “dot” is a check valve. When the accelerator pump arm presses on the diaphragm, this silicone/rubber check valve is pushed upward, applying pressure to the fuel in the bowl, sending the extra shot of fuel up to and through the pump’s discharge squirter nozzle. If it’s not leaking, and if you don’t plan to immerse the bowl in carb cleaner, there’s no reason to disturb this. This valve is secured to the bowl with a formed peg that passes through the floor of the bowl. If you pry it out, chances are high that you’ll damage it, so plan to replace it if you decide to remove it.

#### Step 5: Inspect Check Valve(Critical Inspection)



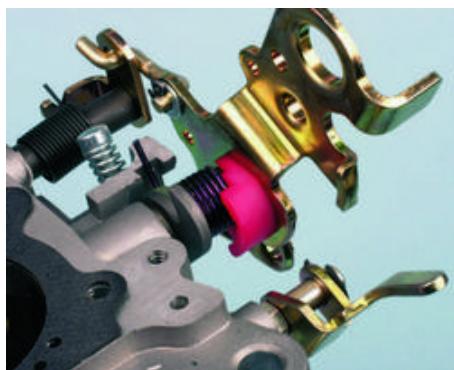
The silicone/rubber check valve has a small nipple that engages the valve to the fuel bowl. Note the small orange head.

#### Step 6: Remove Accelerator Pump Check Valve



Simply pry the face up with a fingernail and pull/wiggle it loose. If you tear the valve's nipple in the process, replace it with a new valve from a Holley rebuild kit. The check valve's nipple has a radiused barb tip that secures the valve in the bowl.

#### Step 7: Inspect Accelerator Pump Cam (Critical Inspection)



The accelerator pump plastic cam is located on the throttle shaft. These typically remain in good condition, but check to make sure there is no damage that would inhibit operation.

#### Step 8: Inspect Throttle Lever



The accelerator pump's throttle lever rides on the cam, influencing how quickly the pump reacts as well as pump duration. You need to verify that it operates as designed.

#### Step 9: Remove Accelerator Pump Cam Screw



The accelerator pump cam is secured to the main throttle lever with a single flat-top screw.



#### Step 10: Select Accelerator Pump Cam



Accelerator pump cams are available in different profiles for accelerator pump tuning purposes. Multiple screw mounting holes are also provided to further tune the cam position (similar in concept to advancing or retarding an engine's camshaft).

#### Step 11: Inspect Accelerator Pump Throttle C-Clip



The accelerator pump throttle lever is held in place on the pivot pin with a steel C-clip. The pivot pin has a groove that accepts the clip.

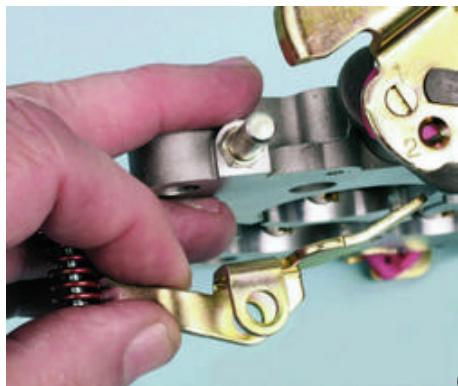
#### Step 12: Remove Accelerator Pump Throttle C-Clip



Pry the C-clip away from the pivot pin with a small flatblade screwdriver. Be careful not to pop it off too quickly, because it's easy to lose. Push

it off about halfway, and then grab it with needle-nose pliers or a hemostat to avoid dropping it.

#### Step 13: Remove Accelerator Pump Lever



Once the C-clip is removed, slide the lever off its pivot pin.

#### Step 14: Inspect Accelerator Pump Throttle Lever Pivot



The accelerator pump throttle lever arm pivots on this pin. If the pin is worn and must be replaced, use a 5/16-inch wrench and rotate counterclockwise to remove it.

### Accelerator Pump Discharge Nozzle Removal

The discharge nozzle, on either the primary or secondary side, is secured with a single 12-28 Phillips-head screw at the top of the main body between the front two barrels (and between the rear two barrels on a Double Pumper). Hold the discharge squirter steady and remove the screw. One small, thin metal sealing washer is under the screw head and one is at the bottom of the nozzle unit. It's very easy to overlook the lower washer because it can be left behind or dropped when the squirter is removed.

Under the discharge nozzle, inside the fuel passage, is a small pump discharge needle valve. Turn the main body upside-down to let this needle valve drop out. If you're not aware of the presence of this small needle valve, it may fall out later when you turn the main body upside down; you'll either not notice it at all or wonder where it came from. It's a good idea to place the squirter, screw, both washers, and the needle valve in a small Ziploc bag to keep them together and prevent losing anything.

**Step 1: Remove Accelerator Pump Discharge Nozzle**



Use a Phillips screwdriver to remove the single machine screw that secures the accelerator pump's squirter discharge nozzle to the main body. This nozzle is being removed from the secondary side of a 4150 carb.

**Step 2: Remove Accelerator Nozzle Gasket (Professional Mechanic Tip)**



The discharge nozzle has two small, thin metal gaskets, one at the top between the screw head and nozzle and one at the base between the nozzle and main body. It's easy to miss the lower gasket, which often remains on the main body. You can easily retrieve it using a small pencil magnet. If you drop it into the venturi, simply open the throttle plate and allow it to drop onto the workbench.

**Step 3: Locate Discharge Nozzle**



Access to the discharge nozzle on the primary side of a carb with a choke is somewhat limited because of the choke plate. Be patient and use a screwdriver to unthread the discharge nozzle screw.

#### Step 4: Remove Discharge Nozzle and Screw



Use needle-nose pliers or a hemostat to retrieve the nozzle and screw as an assembly. Use a pencil magnet to grab the nozzle's base gasket.

#### Step 5: Remove Discharge Nozzle Needle Valve



Remove the small needle valve inside the nozzle's screw hole passage. The easiest method is by carefully turning the

carb upside-down onto a clean rag on the workbench. If you do not remove it now, you may lose it the next time the carb is turned upside-down.

#### Step 6: Organize Discharge Nozzle Parts



To keep things organized, bag the discharge nozzle, screw, gaskets, and needle valve together.

#### Jet Removal

Main metering jets have a straight driver slot. A flat-blade screwdriver may be used, but a much better tool choice is a dedicated jet driver such as the one offered by Holley. This tool has a male tang that engages the slot and a centering tip that keeps the tool centered on the jet, which eliminates the chance of the tool slipping off the slot during removal or installation. Engage the tool and rotate it counterclockwise to remove the jets.

#### Step 1: Select Main Jet Wrench



Although a flat-blade screwdriver can be used to remove or install main jets, a much better choice is a dedicated jet

driver such as those offered by Holley and a few other tool makers.

#### Step 2: Remove Main Jet



This tool has a center round dowel that automatically centers the tool into the face opening of the jet; the flat driver seats into the jet slot. The tool prevents slipping, which can occur with a common flat-blade screwdriver. The tool's center dowel keeps the driver securely positioned.

#### Power Valve Removal

The power valve is threaded into the metering block from the rear. The body of the power valve has a four-sided flat drive instead of a hex. A 1-inch wrench is required for removal or installation. The flats on the power valve are fairly shallow. Although a conventional open-end, box, or socket wrench may be used, a superior choice is a dedicated power-valve wrench. This is a billet aluminum tool that is specifically designed to perfectly engage the power valve without the danger of slipping off or gouging the flats or nearby surfaces.

Rotate the power valve counterclockwise to remove it. The power valve includes a sealing gasket. If you plan to reuse the existing power valve, make note of the gasket style (open center or center with three tangs) because you must use the same style of gasket for the power valve.

#### Step 1: Remove Power Valve



Power valves have a four-sided flat, requiring a 1-inch wrench. However, the drive flats are fairly shallow, so care must be taken to make sure that the wrench remains fully seated. A dedicated power-valve drive tool, such as this one from Willy's Carburetors, eases the job. The billet aluminum power-valve tool is designed specifically for servicing power valves. Insert the tool onto the power valve, holding the tool flush with the metering block and rotate the tool counterclockwise. The knurled grip provides excellent finger traction.

**Step 2: Remove Power Valve (CONTINUED)**



As this photo illustrates, the power-valve tool is not a common 1-inch wrench and is designed specifically to securely engage a Holley power valve. Because the tool is aluminum, it doesn't gouge the metering block.

&



If you plan to perform carb service on a regular basis, this is a must-have tool.

### Overflow Whistle Removal

The white plastic overflow whistle is located on the upper area of the metering block (if so equipped) and is held in its metering block slot with a single interference-fit pin.

#### Step 1: Remove Overflow Whistle Pin



To remove the pin that secures the plastic overflow whistle, insert a flat-blade screwdriver into the rear of the cavity and pry upward to push the screw up. The self-tapping screw is tiny, so bag it for reference. Once the screw has been pushed upward, you may be able to wiggle it free with your fingers. If not, use needle-nose pliers or a hemostat.

#### Step 2: Remove Overflow Whistle

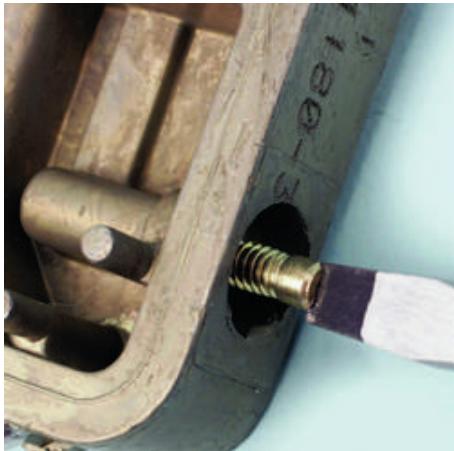


After the locating pin has been removed, you can easily pull the overflow whistle from the metering block.

## Mixture Screw Removal from Metering Block

The needle screw is sealed with a small round gasket in the metering block. You can remove it using these two simple steps.

### Step 1: Remove Idle-Mixture Screw



Rotate the idle-mixture screw

counterclockwise for removal. If you plan to rebuild the carb, or if you've had a leak at the screw, remove the gasket with a pick.

### Step 2: Remove Idle-Mixture Screw Gasket



If you plan to clean the metering block with

carb solvent, remove the small sealing gasket and replace it with a new gasket.

## Choke Assembly Removal

For carburetors that are equipped with an electric choke, the black-plastic electric choke housing is secured with three 8-32 x 3/8- inch Phillips-head screws. A tension washer maintains pressure on the housing to prevent the housing from accidentally rotating.

An eyelet on the flat-wound spring inside the choke housing engages the choke plate lever. Pull the choke housing straight off; avoid cocking it during removal to prevent potential spring damage.

The choke housing's cast-metal base is attached to the main body with three 8-32 x 11/8-inch Phillips screws. Before removing these screws, remove the small hairpin that secures the vertical choke rod to the choke lever assembly. Use small needle-nose pliers or a hemostat to remove this pin.

When removing the base, note the small orifice with a small round gasket on the backside of the base. This influences manifold vacuum, which circulates air through the housing. In turn, the pull-off piston activates inside the base and aids in opening the choke plate after the engine warms up. Inspect this small gasket. If damaged, it may be the cause of a formerly "mysterious" vacuum leak.

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## Electric Choke Dissassembly

An electric choke has a black plastic thermal-spring housing that's secured to the choke lever assembly with three screws. A small hairpin secures the choke rod to the choke assembly lever.

### Step 1: Remove Electric Choke



Remove the three screws and the black spring housing along with the spring-steel three-hole washer. The outer tension washer applies pressure to maintain the choke housing's clock position once it's adjusted.

#### Step 2: Remove Choke Gasket



The large flat gasket should remove easily, unless heat and age have caused it to stick. If so, use a razor blade to scrape the gasket free.

#### Step 3: Inspect Choke Spring



A tang connects to the choke spring eyelet (upper right inside the casting). This spring inside the choke housing is in its rest position. It pushed the choke plate rod up and caused the choke plate to close. As the spring heats, the lever pulls the choke rod down and opens the choke plate.

#### **Step 4: Remove Cotter Pin from Choke Rod (Professional Mechanic Tip)**

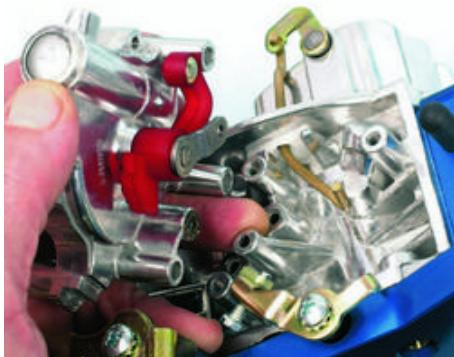


Before removing the electric choke's cast base from the main body, remove the small cotter pin that secures the choke rod to the choke assembly lever. Needle-nose pliers or a hemostat makes this easy. Using a hemostat allows you to not only grab the pin, but because a hemostat locks, the pin is securely retained during removal. A hemostat includes a serrated locking tang between the finger rings. To free the spring clip from its grip simply squeeze the tool together and dislocate its locking serrations.

#### **Mechanical Choke Dissassembly**

A mechanical choke assembly attaches to the main body in the same manner as an electric choke. It's secured with three screws, and the choke plate rod engages to a lever on the choke assembly, which is pinned with a small hairpin. Remove the pin before removing the three mounting screws.

#### **Step 1: Separate Choke Assembly from Main Body**



Remove the three screws holding the cast choke base assembly to the main body.

#### **Step 2: Inspect Air Vent Tubes (Critical Inspection)**



Note the air vent tubes on the base casting (at left). The larger tube at the lower left is the air “intake” tube that allows outside air into the housing. The smaller tube just inside the round base is a vacuum port that feeds from manifold vacuum to assist the pull-off piston that aids in opening the choke plate when the engine warms up.

#### Step 3: Inspect Air Vent Tube Gasket



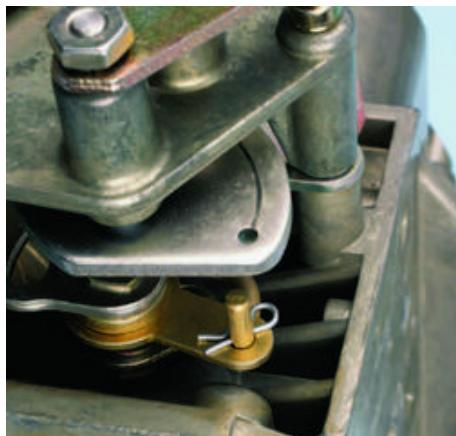
A small gasket seals the vacuum port that provides vacuum to the pull-off piston inside the choke housing base. A damaged gasket could explain a vacuum leak that you previously couldn't find. Regardless, before reinstalling the base, always install a new gasket in this location.

#### Step 4: Remove Choke Armature from Main Body



Locate the three screws that mount the choke lever base on a 4150-series carb to the main body.

**Step 5: Remove Choke Rod**



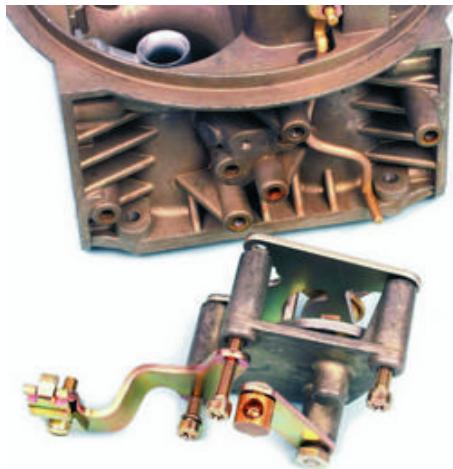
Before removing the three choke lever assembly screws, note that the choke plate-actuating rod engages to a lever on the bolt-on assembly. The choke rod is secured with a small hairpin that must be removed first.

**Step 6: Remove Choke Lever Assembly**



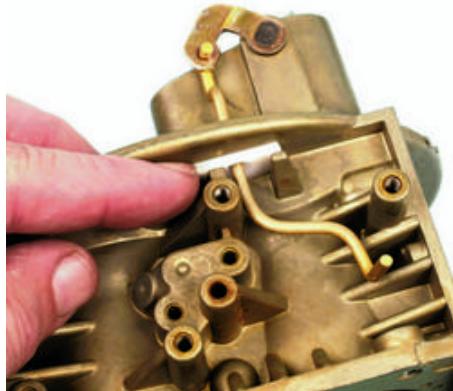
Use a Phillips screwdriver to remove the three choke lever assembly screws from the main body.

**Step 7: Remove Choke Lever Assembly (CONTINUED)**



Remove the choke lever mechanism. The formed bracket at the rear (left side of photo) shares two of the mounting screws. This bracket includes a cable pinch mount for the manual-choke cable.

#### Step 8: Inspect Choke Plate Rod



The choke plate rod has a nylon plate that helps to guide the rod with reduced friction.

#### Step 9: Inspect Choke Plate for Damage(Critical Inspection)



The choke plate rod may seem loose now, but it's captured at the top where the rod's 90-degree bend engages the choke plate lever. The rod can't be removed without bending the rod or the upper lever, which should be avoided. Of course, the choke plate could be removed, but that presents a problem because the choke plate is staked to the choke plate shaft. If there's no need to remove the choke plate (damage, etc.), there's no reason to remove this rod.

### Vacuum Secondary Diaphragm Removal

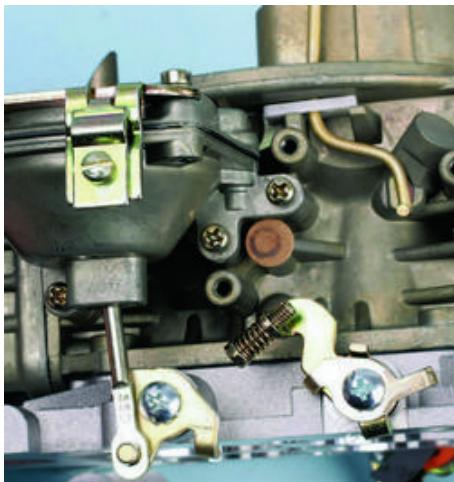
The vacuum secondary assist unit mounts to the passenger's side of the main body, secured with three Phillips-head screws. The choke assembly base hides access to the forward-most screw, so the choke assembly must be removed first. A single Phillips-head screw secures the bottom of the vacuum secondary actuator rod that connects to the secondary throttle plate shaft. Remove this screw first.

Remove the three screws that secure the vacuum assembly to the main body, and then wiggle the actuator rod's lower lever off of the secondary throttle shaft. This lever is engaged to the shaft via a two-sided flat design and the fit may be fairly tight. If necessary, use a small flat-blade screwdriver as a pry tool between the baseplate and lever. Pry gently, little by little, on opposite sides of the lever until it is free.

A small gasket seals the vacuum feed on the backside of the vacuum housing. On a "traditional" Holley, the lid of the vacuum housing is secured with four 8-32 x 1-inch Phillips-head screws. Remove these four screws and lift off the lid and spring. The diaphragm now pops up like an upside-down umbrella. This is a good example to justify upgrading to Holley's latest vacuum lid assembly; the spring can be changed without disturbing the diaphragm. This newer design is standard on 4150 Avenger carbs.

If the diaphragm needs to be replaced, the actuator rod is secured to the lower lever by a very small C-clip. Removing the C-clip and separating the lower lever from the rod allows you to lift the diaphragm out of the vacuum housing.

#### Step 1: Locate Vacuum Secondary Screws



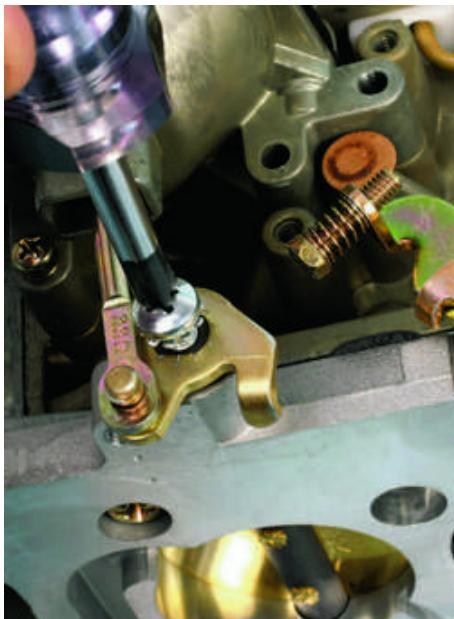
The vacuum secondary unit is secured to the main body with three screws and to the secondary throttle shaft with a single screw. Remove the choke assembly to gain access to the forward most of the three screws that hold the unit to the main body.

#### Step 2: Remove Rod Lever Screw



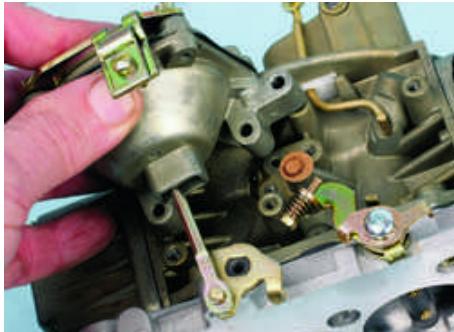
Loosen the three mounting screws, but wait to remove the three housing mounting screws until you remove the lower screw that holds the rod lever to the throttle shaft.

#### Step 3: Remove Vacuum Actuator Rod Screw



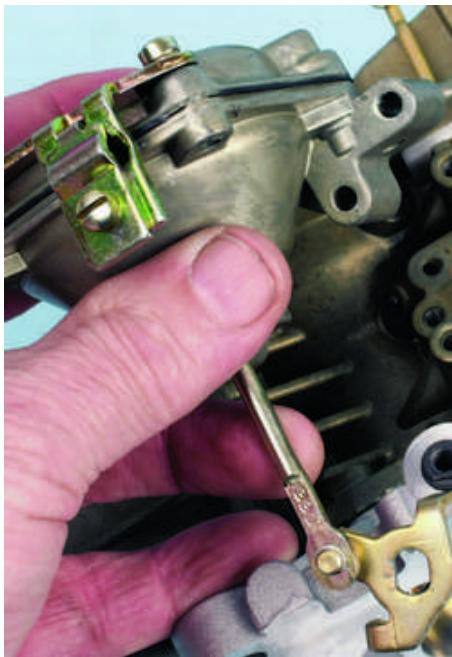
Remove the lower screw that secures the vacuum actuator rod lever to the secondary throttle shaft.

#### Step 4: Remove Vacuum Secondary (Important!)

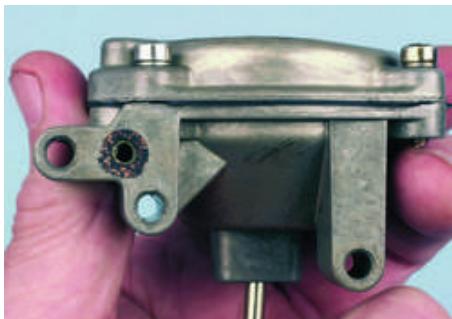


The lever is positioned onto the throttle shaft with engaging flats. The lever may be a bit tight, so be patient and wiggle the lever loose from the shaft. Slight prying may be needed, but be careful not to bend the lever.

Remove the vacuum secondary unit from the carb.



#### Step 5: Inspect Vacuum Port Gasket



The vacuum secondary assembly has an internal diaphragm that is an integral part of the actuator rod. Notice the small port with a gasket on the backside of the vacuum unit. This aligns with the vacuum port on the main body. Always plan to replace this gasket.

The vacuum port on the main body feeds the vacuum unit.



**Step 6: Remove Vacuum Assembly Top Cover**



The vacuum unit's lid is secured with four 8-32 x 1-inch screws. Removing the vacuum housing's lid reveals the spring and the diaphragm.

**Step 7: Remove Diaphragm**



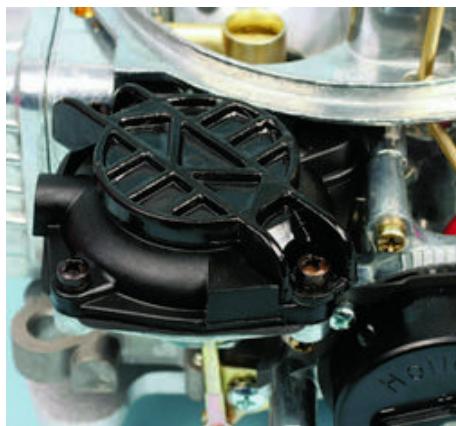
The diaphragm and actuator rod is a pre-assembled unit. Remove the lower rod lever from the rod to remove the diaphragm from the housing.

#### Step 8: Remove Actuator Rod C-Clip



The vacuum secondary actuator rod is secured to the throttle shaft lever with a very small C-clip.

### Step 9: Replace Spring



The Avenger series has a modular vacuum secondary assembly that allows the spring to be replaced without the need to remove the entire vacuum unit from the carb. In addition to serving as standard equipment on the Avenger series, this upgrade is available as a kit to convert any Holley vacuum secondary unit to this modular style.

Remove the two screws that hold the spring lid and the spring in place. The diaphragm remains contained under a separate cover. If you only want to change springs, this design avoids having to deal with disturbing and re-seating the diaphragm.



### Main Body and Baseplate Separation

The main body is secured to the baseplate/throttle body with six 12-24 x 3/4-inch screws. These screws have a Phillips-style head. With all six screws removed, the main body should part easily from the throttle body.

As mentioned earlier, the accelerator pump levers and cams are easy to remove from the baseplate. If the throttle shafts appear to be sticking badly or are worn, the throttle plates must be removed from the shafts so you can slide the shafts out of the baseplate. However, each throttle plate is secured to the shaft with a pair of small screws. The opposite side of the screw is deformed at the factory to prevent accidental loosening.

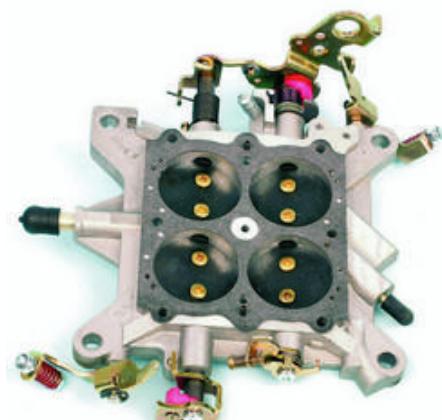
To remove these screws, use a die grinder to carefully grind off the protruding end of each screw so that it is flush with the shaft surface. Use extreme care to avoid damaging the shafts. If the throttle shafts are operating as designed, leave them alone and don't disturb the throttle-plate screws.

#### Step 1: Remove Base Plate Screws



Use a Phillips-style driver to remove all six baseplate screws. Be careful to avoid slipping the driver to prevent gouging or scratching the baseplate's manifold mating surface. Each baseplate screw has a lock washer.

#### Step 2: Inspect Baseplate



This is an overhead view of the baseplate (also called the throttle body) from a 4150 Double Pumper carb.

**Step 3: Inspect Main Body**



This is the bottom view of the main body of a 4150 carb.

**Step 4: Remove Throttle Plate Screws**



Each throttle plate is secured to the throttle shaft with a pair of screws. Grind off the opposite ends of the screws to remove them.

The screw tips are mashed/deformed to prevent the screws from loosening. If you must remove the throttle plates, use great care when grinding these down to avoid damaging the throttle shaft. Also, if you do remove the throttle plates, keep them organized for venturi bore location.



Written by Mike Mavrigian and Posted with Permission of CarTechBooks

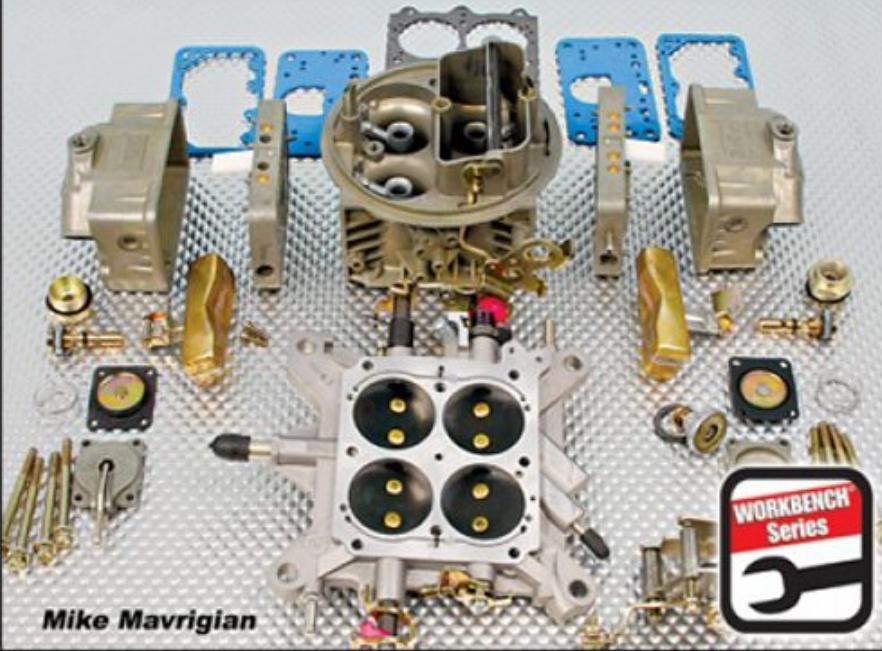
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